

WHAT IS CLAIMED IS:

1. A cleaning composition for removing resists, comprising a salt of hydrofluoric acid and a base not containing a metal (A component), a water-soluble organic solvent (B1 component), at least one acid selected from a group consisting of organic acid and inorganic acid (C component) and water (D component), and having hydrogen ion concentration (pH) of 4-8.
2. A cleaning composition for removing resists, comprising a salt of hydrofluoric acid and a base not containing a metal (A component), a water-soluble organic solvent (B1 component), at least one acid selected from a group consisting of organic acid and inorganic acid (C component), water (D component) and an ammonium salt (E1 component), and having hydrogen ion concentration (pH) of 4-8.
3. The cleaning composition for removing resists according to claim 1, wherein the water-soluble organic solvent (the B1 component) is a mixture of amides and polyhydric alcohol or its derivative.
4. The cleaning composition for removing resists according to claim 1, wherein the base not containing a metal for forming the salt of hydrofluoric acid and a base not containing a metal (the A component) is at least one base selected from a group consisting of an organic amine compound, ammonia and lower quaternary ammonium base.
5. The cleaning composition for removing resists according to claim 1, wherein the content of the salt of hydrofluoric acid and a base not containing a metal (the A component) is 0.01-1 mass %.
6. A cleaning composition for removing resists, comprising a salt of hydrofluoric acid and a base not containing a metal (A component), a water-soluble organic solvent (B2 component), phosphonic acid (C1 component), water (D component), and a base not containing a metal (E component), and

5       having hydrogen ion concentration (pH) of 2-8.

7. The cleaning composition for removing resists according to claim 6, wherein the water-soluble organic solvent (the B2 component) is a mixture of a sulfur-containing compound and polyhydric alcohol or its derivative.

5       8. A cleaning composition for removing resists, comprising a salt of hydrofluoric acid and a base not containing a metal (A component), a water-soluble organic solvent (B2 component), phosphonic acid (C1 component), water (D component), a base not containing a metal (E component) and a Cu corrosion inhibitor (F component), and having hydrogen ion concentration (pH) of 2-8.

9. The cleaning composition for removing resists according to claim 8, wherein the Cu corrosion inhibitor (the F component) includes at least one kind selected from a group consisting of triazoles, aliphatic carboxylic acids, aromatic carboxylic acids and amino carboxylic acids.

5       10. A manufacturing method of a semiconductor device, comprising the steps of: forming a metal film having copper as its main component on a semiconductor substrate; forming an insulating film thereon; forming a resist film further thereon; providing a hole or a trench in the insulating film by dry etching using the resist film as a mask; removing the resist by gas plasma processing or heat treatment; and removing remaining resist residue using the cleaning composition for removing resists according to claim 1.

11. The manufacturing method of a semiconductor device according to claim 10, wherein the resist film used as the mask in said dry etching is a chemically amplified excimer resist.

12. A manufacturing method of a semiconductor device, comprising

the steps of: forming a metal film having copper as its main component on a semiconductor substrate; forming an insulating film thereon; forming a resist film further thereon; providing a hole or a trench in the insulating film by dry etching using the resist film as a mask; and removing the remaining resist film and resist residue produced during the dry etching using the cleaning composition for removing resists according to claim 1.

13. A manufacturing method of a semiconductor device, comprising the steps of: forming a metal film having copper as its main component on a semiconductor substrate; forming an insulating film thereon; providing a hole in the insulating film reaching the metal film by dry etching; and removing etching residue produced during the dry etching using the cleaning composition for removing resists according to claim 1.